WE CLAIM:

1. A polymer prepared by polymerization of a monomer mixture, the mixture comprising:

(a) at least one first olefinic monomer containing an acetal or ketal linkage, the acid-catalyzed cleavage of which renders the polymer soluble in aqueous base; and

(b) at least one second olefinic monomer selected from (i) an olefinic monomer containing a pendant fluorinated hydroxyalkyl group R^H, (ii) an olefinic monomer containing a pendant fluorinated alkylsulfonamide group R^S, and (iii) combinations thereof.

2. The polymer of claim 1, wherein the acetal or ketal linkage is contained within an acid-cleavable substituent R^{CL} in the first olefinic monomer, the acid-cleavable substituent having the structure

(I) $$-(L^1)_m-(X)_n-(L^2)_q-R^1$$

in which:

m, n, and q are independently zero or 1;

L^1 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^1 is optionally substituted and/or heteroatom-containing C_1-C_{12} alkylene, L^1 may be linear, branched, or cyclic;

X is selected from C_3-C_{30} alicyclic and substituted C_3-C_{30} alicyclic;

L^2 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^2 is optionally substituted and/or heteroatom-containing C_3-C_{12} alkylene, L^2 may be linear, branched, or cyclic; and

R^1 is selected from acetal-containing and ketal-containing substituents.

3. The polymer of claim 2, wherein:

L^1 is selected from C_1-C_{12} alkylene, and heteroatom-containing C_1-C_{12} alkylene;

X is C_3-C_{18} alicyclic;

L^2 is selected from C_1-C_{12} alkylene, hydroxyl-substituted C_1-C_{12} alkylene, C_1-C_{12} fluoroalkylene, and hydroxyl-substituted C_1-C_{12} fluoroalkylene; and

R^1 has the structure -(CO)-O-CR^4R^5-O-$CR^6R^7R^8$ in which R^4, R^5, R^6, R^7, and R^8 are selected so as to render R^1 acid-cleavable.

4. The polymer of claim 3, wherein:

R^4, R^5, R^6, R^7, and R^8 are independently selected from hydrogen, C_4-C_{12} hydrocarbyl, substituted C_4-C_{12} hydrocarbyl, heteroatom-containing C_4-C_{12} hydrocarbyl, and substituted heteroatom-containing C_4-C_{12} hydrocarbyl, and further wherein any two of R^4, R^5, R^6, R^7, and R^8 may be linked to form a cyclic group.

5. The polymer of claim 4, wherein:

L^1 is selected from C_1-C_{12} alkylene, and heteroatom-containing C_1-C_{12} alkylene;

X is C_6-C_{12} alicyclic; and

L^2 is of the formula $-CR^9R^{10}-$ wherein R^9 is hydrogen, C_1-C_{12} alkyl, or C_1-C_{12} fluoroalkyl, and R^{10} is C_1-C_{12} alkyl or C_1-C_{12} fluoroalkyl.

6. The polymer of claim 1, wherein the second olefinic monomer contains a pendant fluorinated hydroxyalkyl group R^H.

7. The polymer of claim 6, wherein R^H has the structure $-L^3-CR^{11}R^{12}-OH$, in which:

L^3 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, C_3-C_{15} alicyclic, C_3-C_{15} fluoroalicyclic, and combinations thereof;

R^{11} is selected from hydrogen, C_1-C_{24} alkyl, and substituted C_1-C_{24} alkyl; and

R^{12} is C_1-C_{24} alkyl or fluorinated C_1-C_{24} alkyl, with the proviso that at least one of R^{11} and R^{12} is fluorinated; and further wherein R^{11} and R^{12} can be taken together to form a ring.

8. The polymer of claim 7, wherein R^{11} is selected from hydrogen, C_1-C_{12} alkyl, and C_1-C_{12} haloalkyl, and R^{12} is C_1-C_{12} alkyl or fluorinated C_1-C_{12} alkyl.

9. The polymer of claim 8, wherein R^{11} is selected from hydrogen, C_1-C_8 alkyl, and fluorinated C_1-C_8 alkyl, and R^{12} is C_1-C_8 alkyl or fluorinated C_1-C_8 alkyl.

10. The polymer of claim 9, wherein R^{11} is selected from hydrogen, C_1-C_4 alkyl, semi-fluorinated C_1-C_4 alkyl, and perfluorinated C_1-C_4 alkyl, and R^{12} is C_1-C_4 alkyl, semi-fluorinated C_1-C_4 alkyl, or perfluorinated C_1-C_4 alkyl.

11. The polymer of claim 10, wherein R^{11} and R^{12} are both trifluoromethyl.

12. The polymer of claim 1, wherein the second olefinic monomer contains a pendant fluorinated alkylsulfonamide group R^S.

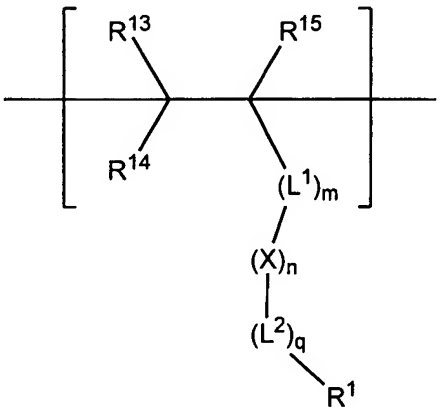
13. The polymer of claim 12, wherein R^S has the structure $-L^3-SO_2-NHR^{16}$, in which:

L^3 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, C_3-C_{15} alicyclic, C_3-C_{15} fluoroalicyclic, combinations thereof; and

R^{16} is selected from C_1-C_{24} alkyl and substituted C_1-C_{24} alkyl, C_1-C_{24} fluoroalkyl and substituted C_1-C_{24} fluoroalkyl.

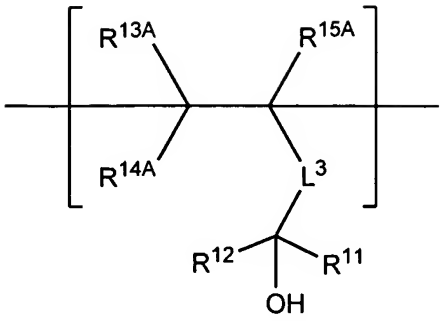
14. A polymer comprising a first olefinic monomer unit having the structure of formula (II)

(II)



and a second olefinic monomer unit having the structure of formula (III)

(III)



wherein:

m, n, and q are independently zero or 1;

L^1 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^1 is optionally substituted and/or heteroatom-containing C_1-C_{12} alkylene, L^1 may be linear, branched, or cyclic;

X is selected from C_3-C_{30} alicyclic and substituted C_3-C_{30} alicyclic;

L^2 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^2 is optionally substituted and/or heteroatom-containing C_3-C_{12} alkylene, L^2 may be linear, branched, or cyclic; and

R^1 is selected from acetal-containing and ketal-containing substituents;

L^3 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, C_3-C_{15} alicyclic, C_3-C_{15} fluoroalicyclic, and combinations thereof;

R^{11} is selected from hydrogen, C_1-C_{24} alkyl, and substituted C_1-C_{24} alkyl;

R^{12} is C_1-C_{24} alkyl or fluorinated C_1-C_{24} alkyl, with the proviso that at least one of R^{11} and R^{12} is fluorinated; and further wherein R^{11} and R^{12} can be taken together to form a ring;

R^{13} and R^{13A} are independently selected from hydrogen, fluorine, C_1-C_{24} alkyl, substituted C_1-C_{24} alkyl, C_1-C_{24} alkoxy, and substituted C_1-C_{24} alkoxy; and

R^{14} and R^{14A} are independently selected from hydrogen, fluorine, C_1-C_{24} alkyl and substituted C_1-C_{24} alkyl; and

R^{15} and R^{15A} are independently selected from hydrogen, fluorine, C_1-C_{24} alkyl, and substituted C_1-C_{24} alkyl, and further wherein any two of L^1, R^{13}, R^{14}, and R^{15} may be taken together to form a ring and any two of L^3, R^{13A}, R^{14A}, and R^{15A} may be taken together to form a ring.

15. The polymer of claim 14, wherein

L^1 is selected from C_1-C_{12} alkylene, and heteroatom-containing C_1-C_{12} alkylene;

X is C_3-C_{18} alicyclic;

L^2 is selected from C_1-C_{12} alkylene, hydroxyl-substituted C_1-C_{12} alkylene, C_1-C_{12} fluoroalkylene, and hydroxyl-substituted C_1-C_{12} fluoroalkylene;

R^1 has the structure -(CO)-O-CR^4R^5-O-$CR^6R^7R^8$ in which R^4, R^5, R^6, R^7, and R^8 are selected so as to render R^1 acid-cleavable;

R^{11} is selected from hydrogen, C_1-C_{12} alkyl, and C_1-C_{12} haloalkyl; and

R^{12} is C_1-C_{12} alkyl or fluorinated C_1-C_{12} alkyl; and further wherein R^{11} and R^{12} can be taken together to form a ring.

16. The polymer of claim 15, wherein

R^4, R^5, R^6, R^7, and R^8 are independently selected from hydrogen, C_4-C_{12} hydrocarbyl, substituted C_4-C_{12} hydrocarbyl, heteroatom-containing C_4-C_{12} hydrocarbyl, and substituted heteroatom-containing C_4-C_{12} hydrocarbyl, and further wherein any two of R^4, R^5, R^6, R^7, and R^8 may be linked to form a cyclic group;

R^{11} is selected from hydrogen, C_1-C_8 alkyl, and fluorinated C_1-C_8 alkyl; and

R^{12} is C_1-C_8 alkyl or fluorinated C_1-C_8 alkyl; and further wherein R^{11} and R^{12} can be taken together to form a ring.

17. The polymer of claim 16, wherein

L^1 is selected from C_1-C_6 alkylene, and heteroatom-containing C_1-C_6 alkylene;

X is C_6-C_{12} alicyclic; and

L^2 is of the formula $-CR^9R^{10}-$ wherein R^9 is hydrogen, C_1-C_{12} alkyl, or C_1-C_{12} fluoroalkyl, and R^{10} is C_1-C_{12} alkyl or C_1-C_{12} fluoroalkyl;

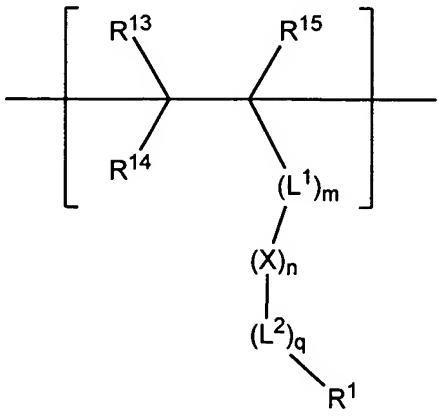
R^{11} is selected from hydrogen, C_1-C_4 alkyl, semi-fluorinated C_1-C_4 alkyl, and perfluorinated C_1-C_4 alkyl; and

R^{12} is C_1-C_4 alkyl, semi-fluorinated C_1-C_4 alkyl, or perfluorinated C_1-C_4 alkyl.

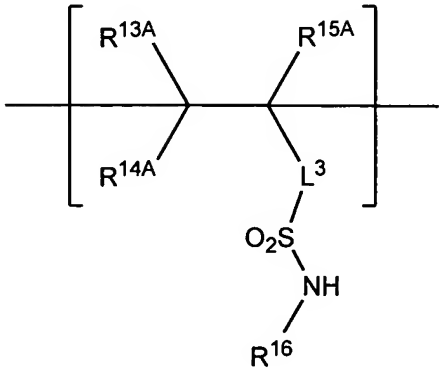
18. The polymer of claim 17, wherein R^{11} and R^{12} are both trifluoromethyl.

19. A polymer comprising a first olefinic monomer unit having the structure of formula (II)

(II)



and a second olefinic monomer unit having the structure of formula (IV)

(IV) 

wherein:

m, n, and q are independently zero or 1;

L^1 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^1 is optionally substituted and/or heteroatom-containing C_1-C_{12} alkylene, L^1 may be linear, branched, or cyclic;

X is selected from C_3-C_{30} alicyclic and substituted C_3-C_{30} alicyclic;

L^2 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^2 is optionally substituted and/or heteroatom-containing C_3-C_{12} alkylene, L^2 may be linear, branched, or cyclic; and

R^1 is selected from acetal-containing and ketal-containing substituents;

L^3 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, C_3-C_{15} alicyclic, C_3-C_{15} fluoroalicyclic, and combinations thereof;

R^{13} and R^{13A} are independently selected from hydrogen, fluorine, C_1-C_{24} alkyl, substituted C_1-C_{24} alkyl, C_1-C_{24} alkoxy, and substituted C_1-C_{24} alkoxy; and

R^{14} and R^{14A} are independently selected from hydrogen, fluorine, C_1-C_{24} alkyl and substituted C_1-C_{24} alkyl;

R^{15} and R^{15A} are independently selected from hydrogen, fluorine, C_1-C_{24} alkyl, and substituted C_1-C_{24} alkyl, and further wherein any two of L^1, R^{13}, R^{14}, and R^{15} may be taken together to form a ring and any two of L^3, R^{13A}, R^{14A}, and R^{15A} may be taken together to form a ring; and

R^{16} is selected from C_1-C_{24} alkyl and substituted C_1-C_{24} alkyl, C_1-C_{24} fluoroalkyl and substituted C_1-C_{24} fluoroalkyl.

20. The polymer of claim 19, wherein:

L^1 is selected from C_1-C_{12} alkylene, and heteroatom-containing C_1-C_{12} alkylene;

X is C_3-C_{18} alicyclic;

L^2 is selected from C_1-C_{12} alkylene, hydroxyl-substituted C_1-C_{12} alkylene, C_1-C_{12} fluoroalkylene, and hydroxyl-substituted C_1-C_{12} fluoroalkylene; and

R^1 has the structure -(CO)-O-CR^4R^5-O-$CR^6R^7R^8$ in which R^4, R^5, R^6, R^7, and R^8 are selected so as to render R^1 acid-cleavable.

21. The polymer of claim 20, wherein

R^4, R^5, R^6, R^7, and R^8 are independently selected from hydrogen, C_4-C_{12} hydrocarbyl, substituted C_4-C_{12} hydrocarbyl, heteroatom-containing C_4-C_{12} hydrocarbyl, and substituted heteroatom-containing C_4-C_{12} hydrocarbyl, and further wherein any two of R^4, R^5, R^6, R^7, and R^8 may be linked to form a cyclic group.

22. The polymer of claim 21, wherein

L^1 is selected from C_1-C_6 alkylene, and heteroatom-containing C_1-C_6 alkylene;

X is C_6-C_{12} alicyclic; and

L^2 is of the formula $-CR^9R^{10}-$, wherein R^9 is hydrogen, C_1-C_{12} alkyl, or C_1-C_{12} fluoroalkyl, and R^{10} is C_1-C_{12} alkyl or C_1-C_{12} fluoroalkyl.

23. The polymer of claim 1, wherein the monomer mixture comprises two or more different first olefinic monomers.

24. The polymer of claim 1, wherein the monomer mixture further comprises at least one additional olefinic monomer.

25. The polymer of claim 23, wherein monomer mixture further comprises at least one additional olefinic monomer.

26. The polymer of claim 24, wherein the at least one additional olefinic monomer is selected from (i) a monomer containing an acid-cleavable substituent R^{CL*}; (ii) a monomer containing an acid-inert, polar substituent, R^P; (iii) a monomer containing an acid-inert, nonpolar substituent, R^{NP}; and (iv) combinations thereof.

27. The polymer of claim 26, comprising monomer units substituted with R^P and optionally R^{NP}.

28. The polymer of claim 26, comprising monomer units substituted with R^{NP} and optionally R^{P}.

29. The polymer of claim 26, wherein R^{CL*} has the structure

(V) $$-(L^{1*})_{m*}-(X*)_{n*}-[(L^{2*})_{q*}-R^{1*}]_{r*}$$

in which:

m*, n*, and q* are independently zero or 1;

r* is an integer of at least 1;

L^{1*} is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^{1*} is optionally substituted and/or heteroatom-containing C_1-C_{12} alkylene, L^{1*} may be linear, branched, or cyclic;

X* is selected from C_3-C_{30} alicyclic and substituted C_3-C_{30} alicyclic;

L^{2*} is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^{2*} is optionally substituted and/or heteroatom-containing C_3-C_{12} alkylene, L^{2*} may be linear, branched, or cyclic; and

R^{1*} is selected from acid-cleavable ester, oligomeric ester, ether, carbonate, and orthoester substituents.

30. The polymer of claim 29, wherein:

r* is 1 or 2;

L^{1*} is selected from C_1-C_{12} alkylene, and heteroatom-containing C_1-C_{12} alkylene;

X* is C_3-C_{18} alicyclic;

L^{2*} is selected from C_1-C_{12} alkylene, hydroxyl-substituted C_1-C_{12} alkylene, C_1-C_{12} fluoroalkylene, and hydroxyl-substituted C_1-C_{12} fluoroalkylene; and

R^{1*} is selected from -(CO)-O-R^{4*}, -[Q^{1*}-(CO)-O-]$_{h*}$-R^{5*}, -O-R^{6*}, and -O-(CO)-O-R^{7*};

h* is an integer in the range of 2 to 8 inclusive,

Q^{1*} is C_1-C_{12} alkylene or C_1-C_{12} fluoroalkylene,

R^{4*} and R^{6*} are selected from (a) hydrocarbyl substituents with a tertiary carbon attachment point, (b) substituents having the structure -$CR^{8*}R^{9*}$-O-$CR^{10*}R^{11*}R^{12*}$, and (c) substituents having the structure -$CR^{13*}(OR^{14*})_2$;

R^{5*}, R^{7*}, and R^{14*} are selected from C_4-C_{12} hydrocarbyl, substituted C_4-C_{12} hydrocarbyl, heteroatom-containing C_4-C_{12} hydrocarbyl, and substituted heteroatom-containing C_4-C_{12} hydrocarbyl; and

R^{8*}, R^{9*}, R^{10*}, R^{11*}, R^{12*}, and R^{13*} are independently selected from hydrogen, C_4-C_{12} hydrocarbyl, substituted C_4-C_{12} hydrocarbyl, heteroatom-containing C_4-C_{12} hydrocarbyl, and substituted heteroatom-containing C_4-C_{12} hydrocarbyl, and further wherein any two of R^{8*}, R^{9*}, R^{10*}, R^{11*}, and R^{12*} may be linked to form a cyclic group.

31. The polymer of claim 30, wherein:

L^{1*} is selected from C_1-C_6 alkylene, and heteroatom-containing C_1-C_6 alkylene;

X* is C_6-C_{12} alicyclic; and

L^{2*} is of the formula -$CR^{9*}R^{10*}$-, wherein R^{9*} is hydrogen, C_1-C_{12} alkyl, or C_1-C_{12} fluoroalkyl, and R^{10*} is C_1-C_{12} alkyl or C_1-C_{12} fluoroalkyl.

32. The polymer of claim 31, wherein R^{1*} is of the formula -(CO)-O-R^{4*}, wherein R^{4*} is selected from cyclic and acyclic hydrocarbyl substituents with a tertiary carbon attachment point, such that when r* is 1, then R^{CL*} has the structure

(VI) $$-(L^{1*})_{m*}-(X^*)_{n*}-(CR^{9*}R^{10*})_{q*}-(CO)-O-R^{4*} \quad .$$

33. The polymer of claim 31, wherein R^{1*} is of the formula -O-R^{6*}, wherein R^{6*} is selected from cyclic and acyclic hydrocarbyl substituents with a tertiary carbon attachment point, such that when r* is 1, then R^{CL*} has the structure

(VII) $$-(L^{1*})_{m*}-(X^*)_{n*}-(CR^{9*}R^{10*})_{q*}-O-R^{6*} \quad .$$

34. The polymer of claim 32, wherein R^{4*} is selected from t-butyl, 2-methyl-2-norbornyl, 2-methyl-2-adamantyl, 2-ethyl-2-adamantyl, isobornyl, 2-methyl-2-isobornyl, 2-methyl-2-tetracyclododecyl, 1-methylcyclohexyl, 1-ethylcyclohexyl, 1-butylcyclohexyl, 1-methylcyclopentyl, 1-ethylcyclopentyl, and 1-butylcyclopentyl.

35. The polymer of claim 33, wherein R^{6*} is selected from t-butyl, 2-methyl-2-norbornyl, 2-methyl-2-adamantyl, 2-ethyl-2-adamantyl, isobornyl, 2-methyl-2-isobornyl, 2-methyl-2-tetracyclododecyl, 1-methylcyclohexyl, 1-ethylcyclohexyl, 1-butylcyclohexyl, 1-methylcyclopentyl, 1-ethylcyclopentyl, and 1-butylcyclopentyl.

36. The polymer of claim 26, wherein R^P has the structure

(VIII) $$-(L^3)_{m1}-(Y)_{n1}-(L^4)_{q1}-R^{18}$$

in which:

m1, n1, and q1 are independently zero or 1;

L^3 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^3 is optionally substituted and/or heteroatom-containing C_1-C_{12} alkylene, L^1 may be linear, branched, or cyclic;

Y is selected from C_3-C_{30} alicyclic and substituted C_3-C_{30} alicyclic;

L^4 is selected from C_1-C_{12} alkylene, substituted C_1-C_{12} alkylene, C_1-C_{12} heteroalkylene, substituted C_1-C_{12} heteroalkylene, and further wherein when L^4 is optionally substituted and/or heteroatom-containing C_3-C_{12} alkylene, L^4 may be linear, branched, or cyclic; and

R^{18} is an acid-inert polar organic group containing a heteroatom with a Pauling electronegativity greater than about 3.00.

37. The polymer of claim 36, wherein:

L^3 is selected from C_1-C_{12} alkylene, and heteroatom-containing C_1-C_{12} alkylene;

Y is C_3-C_{18} alicyclic; and

L^4 is selected from C_1-C_{12} alkylene, hydroxyl-substituted C_1-C_{12} alkylene, C_1-C_{12} fluoroalkylene, and hydroxyl-substituted C_1-C_{12} fluoroalkylene.

38. The polymer of claim 37, wherein:

L^3 is selected from C_1-C_6 alkylene, and heteroatom-containing C_1-C_6 alkylene;

Y is C_6-C_{12} alicyclic; and

L^4 is of the formula $-CR^{21}CR^{22}-$ wherein R^{21} is hydrogen, C_1-C_{12} alkyl, or C_1-C_{12} fluoroalkyl, and R^{22} is C_1-C_{12} alkyl or C_1-C_{12} fluoroalkyl, such that R^P has the structure

(IX) $$-(L^3)_{m1}-(Y)_{n1}-(CR^{21}R^{22})_{q1}-R^{18}.$$

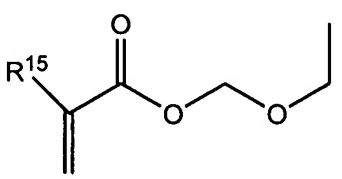
39. The polymer of claim 38, wherein the heteroatom within R^{18} is O or N.

40. The polymer of claim 39, wherein R^{18} is selected from hydroxyl, carboxyl, C_1-C_{12} alkoxy, C_1-C_{12} fluoroalkoxy, hydroxyl-substituted C_1-C_{12} alkoxy, hydroxyl-substituted C_1-C_{12} fluoroalkoxy, C_2-C_{12} alkoxyalkyl, fluorinated C_2-C_{12} alkoxyalkyl, hydroxyl-substituted C_2-C_{12} alkoxyalkyl, fluorinated hydroxyl-substituted C_2-C_{12} alkoxyalkyl, hydroxyl-substituted C_1-C_{12} alkyl, hydroxyl-substituted C_1-C_{12} fluoroalkyl, carboxyl-substituted C_1-C_{12} alkyl, carboxyl-substituted C_1-C_{12} fluoroalkyl, C_2-C_{12} acyl, fluorinated C_2-C_{12} acyl, hydroxyl-substituted C_2-C_{12} acyl, fluorinated hydroxyl-substituted C_2-C_{12} acyl, C_2-C_{12} acyloxy, fluorinated C_2-C_{12} acyloxy, hydroxyl-substituted C_2-C_{12} acyloxy, fluorinated hydroxyl-substituted C_2-C_{12} acyloxy, amino, mono- and di-(C_1-C_{12} alkyl)-substituted amino, amido, mono- and di-(C_2-C_{12} alkyl)amido, sulfonamido, N-heteroalicyclic, oxo-substituted N-heterocyclic, and, where the substituents permit, combinations of two or more of the foregoing.

41. The polymer of claim 26, wherein R^P is selected from lactone, anhydride, sulfonamide, fluoroalkanol, alkanol, alicyclic alkanol, esters, ethers, and a combination thereof.

42. The polymer of claim 26, wherein R^{NP} is C_1-C_{18} hydrocarbyl or fluorinated C_1-C_{18} hydrocarbyl.

43. The polymer of claim 14, wherein the first olefinic monomer unit is derived from a monomer having a structure selected from the formulae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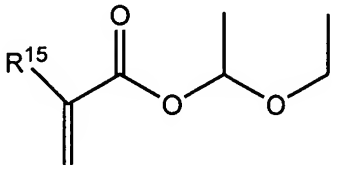
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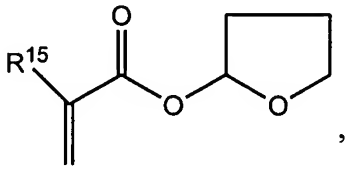
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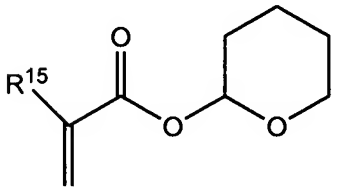
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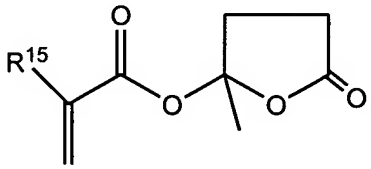
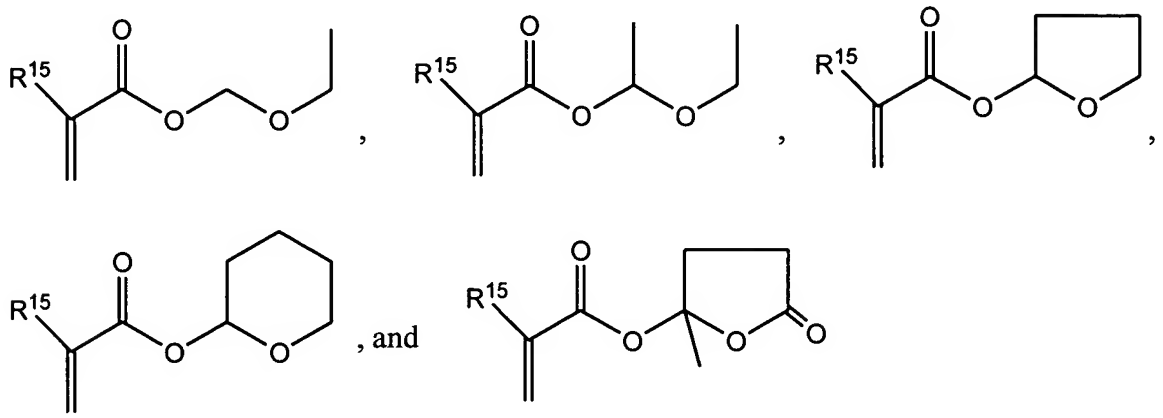


44. The polymer of claim 43, wherein R^{15} is selected from hydrogen, fluorine, C_1-C_{24} alkyl, and fluorinated C_1-C_{24} alkyl.

45. The polymer of claim 19, wherein the first olefinic monomer unit is derived from a monomer having a structure selected from the formulae



46. The polymer of claim 45, wherein R^{15} is selected from hydrogen, fluorine, C_1-C_{24} alkyl, and fluorinated C_1-C_{24} alkyl.

47. A lithographic photoresist composition comprising the polymer of claim 1 and a photoacid generator.

48. The composition of claim 47, further comprising an additive selected from dissolution modifying additives, basic compounds, photospeed control agents, crosslinking agents, surfactants, adhesion promoters, and anti-foaming agents.

49. The composition of claim 48, wherein the dissolution modifying additive is a dissolution inhibitor.

50. The composition of claim 47, further comprising an additional polymer.

51. The composition of claim 50, wherein the polymer is selected from fluorine-containing polymers and non-fluorine-containing polymers.

52. The composition of claim 47, further comprising a solvent.

53. The composition of claim 47, wherein the photoacid generator is an onium salt selected from sulfonium salts and iodonium salts.

54. A lithographic photoresist composition comprising the polymer of claim 14 and a photoacid generator.

55. A lithographic photoresist composition comprising the polymer of claim 19 and a photoacid generator.

56. A polymer blend composition comprising the polymer of claim 1 and at least one additional polymer.